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EXAMINER	
SHAW, JOSEPH D	

ART UNIT	PAPER NUMBER
2141	9

DATE MAILED: 04/16/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application N .	Applicant(s)	
	09/636,004	DEL VAL ET AL.	
	Examiner	Art Unit	
	Joseph D Shaw	2141	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *02 March 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-35,37-40 and 42-52* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-35,37-40 and 42-52* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *09 August 2000* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date 6.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1, 6, 11-14, 19, 24, 28-31, 36, 43, 44, 51 and 52 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lai et al. (Measuring Bandwidth) in view of Bharali et al. (6,216,163).

a. As per claim 1, 6, 11-14, 19, 24, 29-31, 36, 43, 44, 51, and 52 Lai teaches a Packet Pair technique for measuring bandwidth with two packets having a same size s (characteristic); the two packets queued next to each other (sending one packet immediately after the other); reception of the packets spaced apart by t seconds (t3 - t1); calculating bandwidth by dividing t into s (section IV, B, pages 238-239); and the sending and reception of data (packets, bandwidth calculations) (Fig. 1). However, Lai does not disclose the packets being non-compressible. Bharali teaches a network system that utilizes non-compressible packets in when sending messages (col. 8, lines 12-13). It would have been obvious to one of ordinary skill in the art at the time of the invention to include non-compressible packets as taught by Bharali in the invention disclosed by Liu because use of compressible my lead to unpredictable results as taught by Bharali (col. 8, 15-17).

b. As per claim 28, Lai discloses the claimed invention modified by Bharali as described above. However, the invention does not disclose first generating a packet before sending it. However, it is inherent in the invention disclosed by Lai that the packets were generated prior to sending them.

3. Claims 2, 15, 20, 32, and 47 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lai et al. (Measuring Bandwidth) in view of Bharali et al. (6,216,163) as applied to claims 1, 13, 19, 30 and 46 above, and further in view of Takagi et al. (6,272,148).

c. As per claims 2, 15, 20, 32, and 47, Lai discloses the claimed invention modified by Bharali as described above. However, the invention does not disclose utilizing packets that cannot be fragmented. Takagi teaches a network system that utilizes packets that are the maximum size they can be transferred without fragmentation (col. 3, lines 9-18). It would have been obvious to one of ordinary skill in the art at the time of the invention to make the packets the largest size possible while avoiding fragmentation as taught by Takagi in the invention disclosed by Lai/Bharali because it would avoid spending wasteful processing time and improve throughput as taught by Takagi (col. 3, 18-23), giving a better estimate of the actual bandwidth between two entities.

4. Claims 3, 16, 21, 33, and 48 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lai et al. (Measuring Bandwidth) in view of Bharali et al. (6,216,163) as applied to claims 1, 13, 19, 30 and 46 above, and further in view of Lawrence (6,054,943).

d. As per claims 3, 16, 21, 33, and 48, Lai discloses the claimed invention modified by Bharali as described above. However, the invention does not explicitly teach utilizing packets that are highly entropic. Lawrence teaches Shannon's Noiseless Coding Theorem, relating a low entropy source (packet) to having high compression ratios (col. 14, lines 1-3). It would have been obvious to one of ordinary skill in the art at the time of the invention to avoid the low entropy sources (packets) taught by Lawrence in the invention of Lai/Bharali because entropy is related to compression ratios as taught by Lawrence (col. 14, lines 1-3) and a higher entropy would yield lower compression ratios, resulting in non-compressible data.

e. Furthermore, the Examiner would like to note that entropy, in the information theory field, is defined as the randomness of data in a set, wherein the more random the data is the higher the entropy. Since data compression depends on patterns in data, higher randomness of data correlates to lower compression ratios. Therefore, it is inherent that non-compressible packets have a high measure of entropy.

5. Claims 4, 5, 17, 18, 22, 23, 34, 35, 49, and 50 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lai et al. (Measuring Bandwidth) in view of Bharali et al. (6,216,163) as applied to claims 1, 13, 19, 30 and 46 above, and further in view of Kikuchi et al. (6,614,763).

f. As per claims 4, 5, 17, 18, 22, 23, 34, 35, 49, and 50, Lai discloses the claimed invention modified by Bharali as described above. However, the invention does not explicitly teach using either TCP or UDP formatted packets. Kikuchi teaches a bandwidth measurement system that utilizes UDP packets, but also may be used with any other

appropriate type of packet (TCP) (col. 20, lines 21-25). It would have been obvious to one of ordinary skill in the art at the time of the invention to use either UDP or any other packet format (TCP) as taught by Kikuchi in the invention of Lai/Bharali because both packet formats are common packet formats in networks and should be used when determining the bandwidth of a connection that will later serve data formatted in those packet styles.

6. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lai et al. (Measuring Bandwidth) in view of Bharali et al. (6,216,163) as applied to claim 1 above, further in view of Nishigami (5,890,010), and further in view of Microsoft (White Paper: TAPI 3.0 Connection and Media Services).

g. As per claim 7, Lai discloses the claimed invention modified by Bharali as described above. However, the invention does not explicitly teach verifying the result of a bandwidth outside an expected range by querying an entity's modem. Nishigami teaches that a data processing apparatus that verifies abnormal information/conditions (results) is known in prior arts (col. 1, lines 19-27). However, Nishigami does not explicitly teach querying a modem for bandwidth. Microsoft teaches a service that can detect the capabilities (bandwidth) of a device on a line (TAPI) (page 5, Finding a Suitable Line). It would have been obvious to one of ordinary skill in the art at the time of the invention to include verifying abnormal results as taught by Nishigami by querying a modem for its bandwidth as taught by Microsoft in the Lai/Bharali invention because, by verifying what appears to be abnormal

bandwidth measurements, the accuracy of the data collected is kept in tact.

7. Claims 8, 9, and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lai et al. (Measuring Bandwidth) in view of Bharali et al. (6,216,163) as applied to claim 1, and further in view of Hosoi et al. (6,120,149).

h. As per claims 8, 9, and 10, Lai discloses the claimed invention modified by Bharali as described above. However, the invention does not explicitly teach storing recent bandwidth measurements in a list; performing some statistical derivation on the list to determine the most likely actual bandwidth; and more specifically finding the median of the list to determine the most likely actual bandwidth. Hosoi teaches an apparatus that makes repeated measurements and stores them into memory (list) (col. 5, lines 31-33); a statistical process (derivation) determining the typical value of the data (col. 5, lines 33-34); and more specifically that typical value being the median of the data (col. 5, lines 39-42). It would have been obvious to one of ordinary skill in the art at the time of the invention to include a list of measurements and determining the median of the list as taught by Hosoi in the Lai/Bharali invention because a list would provide a better (better than one measurement) understanding of the bandwidth and taking the median of the list to determine actual bandwidth because the median, in math, is defined as the middle value of a set of numbers and therefore cannot be skewed by abnormally high or low measurements.

8. Claims 25 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lai et al. (Measuring Bandwidth) in view of Bharali et al. (6,216,163) as applied to claim 19, and further in view of Linzer et al. (6,005,621).

i. As per claims 25 and 26, Lai discloses the claimed invention modified by Bharali as described above. However, the invention does not explicitly teach sending a file or subfile formatted for the given calculated bandwidth. Linzer teaches a video server delivering high resolution video (file) over high bandwidth connections and low resolution video over low bandwidth connections (col. 7, lines 48-57), wherein the differing resolutions videos are derived from the same video source (subfiles) (Fig. 4; col. 7, lines 48-57). It would have been obvious to one of ordinary skill in the art at the time of the invention to include choosing appropriately formatted files for a given bandwidth as taught by Linzer in the Lai/Bharali invention because a version of a file formatted for low bandwidth would be considered poor quality to users with high bandwidth connections as taught by Linzer (col. 3, lines 1-15).

9. Claim 27 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lai et al. (Measuring Bandwidth) in view of Bharali et al. (6,216,163) as applied to claim 19, and further in view of Ranganathan et al. (5,931,961).

j. As per claim 27, Lai discloses the claimed invention modified by Bharali as described above. However, the invention does not explicitly teach the sent packet being selected from a set of differing packets. Ranganathan teaches testing a network by sending an arbitrary sized packet (first packet) and (if necessary) sending a different sized

packet (set of packets) (Abstract). It would have been obvious to one of ordinary skill in the art at the time of the invention to include having a set of different packets and selecting one from it to send as taught by Ranganathan in the Lia/Bharali invention because having a different type of packet would allow for a different test to be performed if the first one fails, as taught by Ranganathan (Abstract), resulting in a better understanding of the communication path properties.

10. Claims 37, 38, 42, and 45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lai et al. (Measuring Bandwidth) in view of Muuss (The Story of the PING Program).

k. As per claims 37, 42, and 45 Lai teaches a Packet Pair technique for measuring bandwidth (section IV, B, pages 238-239). However, Lai does not explicitly teach generating a list of recent bandwidth measurements. Muuss teaches a list of recent PINGS indicating the amount of time it took the ping to travel round-trip (bandwidth; page 1, lines 18-23). It would have been obvious to one of ordinary skill in the art at the time of the invention to include a list of recent bandwidth measurements, as taught by Muuss, in the Lai invention because trends could then be analyzed on the list of multiple measurements (average round trip (bandwidth) determined), as taught by Muuss (page 1, lines 25-27), and would provide a more accurate measurement of the actual bandwidth than one measurement.

l. As per claim 38, Lai discloses the claimed invention modified by Muuss as described above. However, the invention does not explicitly teach replacing a measurement in an entry with a most recently

calculated measurement. "Official Notice" is taken that both the concept and advantages of replacing older data with newer data are well known and expected in the art. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the Lai/Muuss invention to include replacing older data with newer data because newer data is more representative of the current environment and would allow for a more accurate statistical analysis of the environment, reflecting up to date settings in the environment.

11. Claim 39 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lai et al. (Measuring Bandwidth) in view of Muuss (The Story of the PING Program) as applied to 37 above, and further in view of Bharali et al. (6,216,163).

m. As per claim 39, Lai discloses the claimed invention modified by Muuss as described above. However, the invention does not disclose the packets being non-compressible. Bharali teaches a network system that utilizes non-compressible packets in when sending messages (col. 8, lines 12-13). It would have been obvious to one of ordinary skill in the art at the time of the invention to include non-compressible packets as taught by Bharali in the Liu/Muuss invention because use of compressible my lead to unpredictable results as taught by Bharali (col. 8, 15-17).

12. Claim 40 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lai et al. (Measuring Bandwidth) in view of Muuss (The Story of the PING Program) as applied to 37 above, and further in view of Lawrence (6,054,943).

n. As per claim 40, Lai discloses the claimed invention modified by Muuss as described above. However, the invention does not explicitly teach utilizing packets that are highly entropic. Lawrence teaches Shannon's Noiseless Coding Theorem, relating a low entropy source (packet) to having high compression ratios (col. 14, lines 1-3). It would have been obvious to one of ordinary skill in the art at the time of the invention to avoid the low entropy sources (packets) taught by Lawrence in the invention of Lai/Muuss because entropy is related to compression ratios as taught by Lawrence (col. 14, lines 1-3) and a higher entropy would yield lower compression ratios, resulting in non-compressible data.

o. Furthermore, the Examiner would like to note that entropy, in the information theory field, is defined as the randomness of data in a set, wherein the more random the data is the higher the entropy. Since data compression depends on patterns in data, higher randomness of data correlates to lower compression ratios. Therefore, it is inherent that non-compressible packets have a high measure of entropy.

Response to Arguments

13. Applicant's arguments filed March 2nd, 2004 with regards to claims 1, 6, 11-14, 19, 24, 28-31, 36, 43, 44, 46, 51, and 52 have been fully considered but they are not persuasive.

p. In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the

references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988)and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, applicant argues that Bharali's indication that the use of "compressible packets may lead to unpredictable results" is not sufficient motivation to combine the references because Bharali fails to elaborate on what such unpredictability might relate to. The examiner disagrees. Both Lai and Bharali teach measuring network bandwidth (throughput; See Lai, Abstract; Bharali, col. 8, lines 1-2). Bharali furthermore teaches that the use of compressible packets may lead to unpredictable results (col. 8, lines 13-17). One of ordinary skill in the art would recognize that predictable results are desired because they would provide a better representation of the actual bandwidth determined by the bandwidth measurement system, and therefore Bharali's motivation for using non-compressible packets is sufficient reason for combining the Bharali reference with the Lai reference to reach the claimed invention.

14. Applicant's arguments with respect to claims 37, 38, 41, 12, and 45 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joseph Shaw whose telephone number is 703-305-0094. The examiner can normally be reached on Monday - Thursday and alternate Fridays, 7am - 4pm.

16. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rupal Dharia can be reached on 703-305-4003. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

17. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Joseph Shaw
Examiner
AU 2141

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SUPERVISORY PATENT EXAMINER